ABSTRACT OF THE DISCLOSURE

A defect detection system for thermally imaging a structure that has been energized by a sound energy. The system includes a transducer that couples a sound signal into the structure, where the sound signal causes defects in the structure to heat up. In one embodiment, the sound signal has one or more frequencies that are at or near an eigen-mode of the structure. In another embodiment, a non-linear coupling material is positioned between the transducer and the structure to couple the sound energy from the transducer to the structure. A predetermined force is applied to the transducer and a pulse duration and a pulse frequency of the sound signal are selected so that the sound energy induces acoustic chaos in the structure, thus generating increased thermal energy. A thermal imaging camera images the structure when it is heated by the sound signal.